familiar to the readers of this magazine. The results of his prolonged investigations are here brought together, summed up and illustrated with a beauty and force which make the paper a monumental contribution to archæology and anthropic geology. C.

Glacial Observations in the Umanak District, Greenland. By PROFESSOR GEORGE H. BARTON. *Report B of the Scientific Work of the Boston Party on the Sixth Peary Expedition to Greenland.*

The paper embraces the observations made by Professor Barton on the border of the inland ice in the vicinity of Umanak fiord and upon the large Karajak, Itivdliarsuk and several small valley glaciers. Mr. Barton found the border of the ice usually nearly vertical to the height of ten to forty feet. The surface in the vicinity of the margin was covered with dust holes ranging in diameter from a fraction of an inch up to at least three feet, with an average depth of about two feet. Except the dust found in these holes no detritus occurs on the surface of the inland ice. The largest surface stream found flowed in a channel having a width of twenty feet with a depth of fifteen feet to the surface of the water which was about five feet in depth. At the point observed this river was flowing directly toward the interior with a velocity of three or four miles an hour. The average gradient of the surface measured on the Karajak glacier was found to be 1 in 52. Professor Barton observed that the overhanging marginal faces were in many cases apparently due to a shearing motion of the upper layers over the lower. "This was indicated quite strongly in one instance, where a layer projecting slightly beyond the ones above had caught a little detritus as it rolled down. This same ledge continued from the slightly inclined face along a portion of the overhanging face, and here still the detritus remained which had been caught in its descent before the shearing motion had changed this part of the face to an overhanging one. A cavern presented a chance for a study of the material forming the layer upon which the detritus had lodged, and also for several feet above, showing them to be free from detritus and consequently that the detritus could only have come from the upper surface and caught upon the shelf, while the face was inclined, and that its present overhanging form was due to the shearing motion in the upper portion of the ice"—a very important observation.

Professor Barton gives interesting illustrations of the hold of the

ice upon bowlders, and of its methods of behavior in passing over projecting knobs of rock. He also gives an instructive diagram of the method of discharge of the ice foot where it protrudes into the water. Professor Barton believes that the ice "once extended over all this portion of Greenland, passing out beyond the farthest limits of the present coast line into the open waters of Baffin's Bay." He is not altogether fortunate in his suggestions with reference to Dalrymple Rock, a figure of which he introduces for comparison, with the suggestion that it "presents a marked stoss and lee side, apparently in their appropriate positions as related to the mainland topography seen in the distance." The apparent stoss side faces Baffin's Bay and not the inland ice. There is a radical difference between Dalrymple Rock and the peaks of Ikerasak and of Umanak Island, with which it is put in comparison, in the fact that the pedestals of the two latter are distinctly glaciated, showing that they have been typical nunataks, while the base of Dalrymple Rock shows no signs of glaciation and belongs in an entirely different category.

The paper is admirably illustrated with half tone photographs.

T. C. C.

Seventeenth Annual Report of the United States Geological Survey Part I, Director's Report and other papers; Part II, Economic Geology and Hydrography; Part III, Mineral Resources of the United States. CHARLES D. WALCOTT, Director, Washington, D. C., 1896.

This volumnious report embracing three thousand pages of matter which has just come to hand can only be briefly noticed here. It is hoped that special reviews of its important papers may be given hereafter. The report opens with the usual statement of the operations of the survey by the Director. It includes the work done in the years 1895–6 by the nearly forty parties in geology and palæontology, by the divisions of chemistry and hydrography, by the statisticians, and by the topographic and publication branches. This is followed in Part I by papers on "The Magnetic Declination in the United States," by Henry Gannett; "A Geological Reconnaissance in Northwestern Oregon," by J. S. Diller; "Further Contributions to the Geology of the Sierra Nevada," by H.W. Turner; "A Report on the Coal and Lignite of Alaska," by W. H. Dall; "The Uintaite (Gilsonite) Deposits of Utah,"